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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,261	12/15/2003	Mitsugu Sato	H6808.0005/P005-A	1481

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EXAMINER	
JOHNSTON, PHILLIP A	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/734,261	SATO ET AL.	
	Examiner	Art Unit	
	Phillip A. Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2-13-2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

1. This Office Action is submitted in response to amendment dated 5-15-2006, wherein claims 24 and 34 have been amended. Claims 24-34 are pending.

2. The Double Patenting rejection of the previous Office Action is hereby withdrawn since the USPTO has received and accepted the necessary Terminal Disclaimers on 5-15-2006.

Examiners Response to Arguments

3. Applicant's arguments filed 5-15-2006 have been fully considered but they are not persuasive.

Arguments 1 and 2

Applicant states that, "Keese does not disclose, or suggest the calculation of a value that indicates the relationship between the amount of image translation and beam alignment."

Applicant also states that, " Keese does not disclose how the relationship between the translation and the alignment is calculated."

The applicant is respectfully directed to Keese (373), Column 6, line 52-65, which states; Pattern recognition circuit 48 analyzes the image of magnified boundary portion 68 and generates a signal IND for indicating the position of the image of boundary portion 68 in the field of view. A indicator signal IND is generated for each of the extremes of the focus range. Pattern recognition circuit 48 outputs the respective indicator signals IND to control circuit 50. Control circuit 50 stores and compares portion 68 location indicator signals IND for positions in the field of view of magnified

portion 68 at the extremes of the focus range. Control circuit 50 detects any translation of the magnified portion 68 and generates alignment coil control signals LC1 and LC2. Control circuit 50 provides signals LC1 and LC2 to alignment coils 22 for adjusting electron beam alignment.

The applicant is also respectfully directed to Keese (373), Column 7, line 20-36, which states; The beam alignment process of detecting image translation and adjusting alignment as described above is repeated for the second sample image and any subsequent sample images. The alignment proceeds in an iterative manner taking images of edges at progressive 90° offsets. The iterations stop when the difference in magnitude of the location indicator signals IND for extremes of focal range for a current sample image and previous sample image are less than a prescribed threshold improvement. The prescribed threshold preferably is proportional to the pixel width of display device 32, the magnification of the sample edges. The prescribed threshold varies for a given system and magnification. An exemplary threshold for a system with approximately 500 pixels in each axis, at 100,000 X magnification, and with each pixel approximately 10 nanometers in each dimension, is 5 pixels, or 50 nanometers.

The examiner has interpreted from the Keese (373) reference above in view of the rejection below that Keese (373) uses computer 40 to calculate the image translation amount in pixels after the beam alignment is adjusted and then quantifies the observed image translation by comparing the calculated amount to the

predetermined threshold value of 5 pixels. Adjustment of alignment is then continued until the image translation is less than the threshold amount.

Argument 3

Applicant states that, " The rejection of claim 1 appears to rely on the doctrine of inherency. Please note, however, that the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency. The reference must make clear that the missing descriptive matter is necessarily present in the thing described. Inherency may not be established by probabilities or possibilities."

It is important to point out here that inherency was not used in the 102(b) rejection to establish descriptive matter missing from the Keese (373) reference particularly pertaining to the use of " a control device for calculating a two dimensional deviation between images when said optical element is varied, wherein the control device calculates parameter varied according to an operation condition of the optical element, and supplied to the alignment deflector based on the calculated parameter.", as recited in amended claim 24.

In the rejection, the examiner merely referred to those portions of the applicant's disclosure that more clearly defined the claim terminology, particularly since new claims 24-34 added by preliminary amendment, were broader than the original claims 1-23, also canceled by the preliminary amendment.

For example, the "calculation of a value that indicates the relationship between the amount of image translation and beam alignment ", as stated in the arguments above, is clearly defined in applicants original claim 21, which states; A charged

particle beam apparatus which has a charged particle source, an optical device for aligning a charged particle beam emitted from the charged particle source, and an alignment deflector for performing an axis alignment for the optical device, the charged particle beam apparatus comprising: means for detecting centers of gravity of patterns of two images obtained when a condition of said optical device is changed; means for detecting a deviation between the centers of gravity of the patterns of said two images; and means for calculating a deflection amount of said alignment deflector based on the deviation between the centers of gravity of the patterns of said two images.

Thus when the particular Keese (373) disclosure cited below; i.e., determining an absolute value of the peak first derivative of the smoothed image intensity of each raster scan line and derives an average over all scan lines. , was viewed relative to the applicants use in original claim 21 of a relationship based on the deviation (the amount of image translation) between the centers of gravity of the patterns of two images, it was clear to the examiner that the Keese (373) reference discloses the same means for calculating the deflection amount based on the images obtained at the extremes of the focus range of the objective lens in the form of signals IND.

Claims Rejection – 35 U.S.C. 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 24-31, 33 and 34 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,627,373, to Keese.

Keese (373) clearly discloses the following;

(a) Plural images are obtained using computer 40 to automatically vary the focus of objective lens 28 (optical element); i.e., varied positively and negatively between extremes of the focal range, which are equivalent to condition 1 and 2 of the objective lens as stated in paragraphs [0038] and [0040] of applicants published application No. 20040124364.

Then pattern recognition circuit 48 and control circuit 50 are used to calculate the amount of image translation for the images obtained at each of the extremes of the focus range, which is equivalent to calculating the image deviation or parallax between the images obtained at the extremes of the focus range of the objective lens, as defined in paragraphs [0056] and [0065] of applicants published application No. 20040124364. Then control circuit 50 generates alignment coil control signals LC1 and LC2 to alignment coils 22 (alignment deflectors) for adjusting electron beam alignment, as recited in claims 24,25,28,33, and 34. See Column 6, line 45-65.

(b) Pattern recognition circuit 48 analyzes detector signal FD for imaged features of specimen S, such as position in the field of view and sharpness of the edge image. For example, in one embodiment pattern recognition circuit 48 determines the absolute value of the peak first derivative of the smoothed image intensity of each raster scan line and derives an average over all scan lines. This information is

contained in signal IND provided to control circuit 50. Control circuit 50 stores and analyzes signals IND, and calculates corrections to beam alignment and astigmatism. Control circuit 50 generates control signals LC1 and LC2 for automatically correcting beam alignment, and generates control signal ASC for automatically correcting beam astigmatism, as recited in claims 26,27, and 29-31. See Column 5, line 37-53; and Column 8, line 3-39.

It is implied herein that control circuit 50 calculates values that indicate the relationship between the amount of image translation and beam alignment, which would include calculating a coefficient used to determine the magnitude of the control signal for the alignment coils (deflectors) 22, as recited in claims 26 and 27.

Claims Rejection – 35 U.S.C. 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,627,373, to Keese, in view of Onoguchi, U.S. Patent No. 6,067,164.

Keese (373) as applied above discloses all the limitations of claim 32 but fails to teach the use of a two-dimensional Fourier transform to quantify the image. However, Onoguchi (164) discloses an astigmatism correction apparatus for correcting an astigmatism in an electron optics device that utilizes a Fourier transform unit to obtain a binarized image; an axis extraction unit for obtaining a principal axis and an axis perpendicular to the principal axis of the binarized image; an astigmatism information calculation unit for determining an intensity and a direction of the astigmatism by obtaining a distance between two points at which a sample image region in the binarized image intersects with the principal axis and a distance between two points at which the sample image region in the binarized image intersect with the axis perpendicular to the principal axis; and an adjustment unit for adjusting the stigmater of the charged particle beam optical system according to the intensity and the direction of the astigmatism determined by the astigmatism information calculation unit. See Column 4, line 65-67; Column 5, line 1-25; Column 19, line 51-67; and Column 20, line 1-3.

Therefore it would have been obvious to one of ordinary skill in the art that the electron beam alignment correction apparatus and method of Keese (373) can be modified to use the Fourier transform in accordance with Onoguchi (164), to apply a two-dimensional Fourier transform to the secondary particle signals, thereby adjusting the stigmater of the charged particle beam optical system according to the intensity and the direction of the astigmatism determined by the astigmatism information calculation unit.

Conclusion

8. The Amendment filed on 5-15-2006 under 37 CFR 1.131 has been considered but is ineffective to overcome the references cited in the Office Action mailed 11-15-2005.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 6:30 am to 3:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ
July 10, 2006

Nikita Wells

NIKITA WELLS
PRIMARY EXAMINER 01/11/06